



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,323	04/09/2004	Yosuke Hosoya	09792909-5853	9692

26263 7590 12/21/2006
SONNENSCHN NATH & ROSENTHAL LLP
P.O. BOX 061080
WACKER DRIVE STATION, SEARS TOWER
CHICAGO, IL 60606-1080

EXAMINER

WILLIAMS, SHERMANDA L

ART UNIT	PAPER NUMBER
----------	--------------

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/21/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/821,323	Applicant(s) HOSOYA ET AL.	
	Examiner Shermanda L. Williams	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. No Information Disclosure Statement has been filed as of the first action on the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Oesten et al. (US 2001/0046628 A1). Oesten et al. (herein after Oesten '628) discloses a coated lithium nickel mixed oxide particle and the method of making the particle for use as the cathode material in an electrochemical cell. The coated lithium mixed oxide particles are used to improve the properties of the electrochemical cell. The particle core is a lithium mixed oxide containing nickel (Paragraph 32) such as $\text{Li}_x\text{Ni}_y\text{Mn}_{2-y}\text{O}_4$. The particle coating is a metal oxide or a mixture of alkali metal compounds and metal oxides (Paragraphs 33 and 34). The use of titanium oxide as the particle coating is disclosed (Paragraph 34).

Art Unit: 1745

2. Claims 1, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Li (WO 97/49136). Li discloses a lithium ion battery having a positive electrode material including a lithiated metal oxide core coated with a lithium ion conductor (See page 5 lines 6-19). The core substance of the positive electrode material is a lithiated transition mixed metal oxide having a transition metal selected from titanium, nickel, cobalt, vanadium, and mixtures thereof. The coating substance is an alkali metal-mixed oxide having a metal selected from titanium, boron, aluminum, vanadium, cobalt, and mixtures thereof (See page 6 lines 1-22). The core particles of the positive electrode material range in size from 1 to 50 micrometers (See page 12 lines 7-13). The lithium ion conductor coating has a thickness ranging from 0.0005 to 5 micrometers (See page 14 lines 10-21). Therefore, the coated particle diameter of Li is within the range of 5 to 20 micrometers as claimed by the applicant.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oesten '628 as applied to claims 1. Oesten '628 does not explicitly teach that the weight ratio of the first compound oxide to the second compound oxide is between 96:4 and 65:35. Oesten '628 does teach that the weight ratio of the coating metal oxide to the lithium mixed oxide particles is from 0.01 to 20 percent. The weight ratio of the alkali metal to

Art Unit: 1745

the lithium mixed oxide particles in the cathode is from 0.01 to 10 percent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the weight relationship between the core oxide material and the coating oxide material such as taught by Oesten '628 in order to provide a thick enough coating that inhibits the undesirable reactions of the acid with the electrode material. It has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oesten '628 as applied to claim 1 above and further in view of Spitler (US 2004/0197657 A1). Oesten '628 discloses all the limitations of claim 1 from which claim 3 depends. Oesten '628 does not disclose the spinel structure in the cubic system of the lithium titanium oxide for the coating. Spitler et al. (herein after Spitler '657) teaches the use of a lithium titanium spinel oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) as the positive material for the cathode of a lithium ion battery (Paragraph 1). The lithium titanate spinel oxide allows for an extremely high charge and discharge rate and a large number of charge and discharge cycles (Paragraph 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the mixture of alkali metal compounds and metal oxides coating of Oesten '628 to include a spinel lithium titanate oxide such as taught by Spitler '657 in order to enhance the charge and discharge rate of the electrochemical cell. Such a spinel compound is structurally stable in the electrolyte of the battery.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oesten '628 in view of Naruoka et al (US 6,893,766 B2). Oesten '628 discloses all the limitations of claim 1 from which claim 4 depends. Oesten '628 does not disclose a positive electrode active material having a mean particle diameter of 5 to 20 micrometers.

7. Naruoka et al. (herein after Naruoka '766) teaches a positive active material for a secondary battery. The positive active material is lithium nickel composite oxide (col. 2 lines 45-56). The mean particle diameter of the lithium nickel composite oxide is 4 to 25 micrometers (col. 3 lines 44-51). Naruoka teaches that if the mean particle diameter of the positive electrode active material is smaller than 4 micrometers, there may not be continuous contact with the electrically conductive material. Naruoka also teaches that if the mean particle diameter of the positive electrode active material is larger than 25 micrometers, the electrolyte may not penetrate the electrode material. This would adversely affect the charge and discharge rate of the battery (col. 3 lines 51-59). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the positive electrode active material of Oesten '628 having a mean particle size in the range of 5 to 20 micrometers as taught by Naruoka '766 in order to maintain electrical conductivity within the battery.


Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kweon et al. (US 6,749, 965 B1) discloses a positive active material for a lithium secondary battery.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shermanda L. Williams whose telephone number is (571) 272-8915. The examiner can normally be reached on Mon.-Thurs. 7 AM - 4:30 PM and alternating Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PATRICK RYAN
SUPERVISOR, PATENT EXAMINER